

REMARKS

By this submission previously pending claims 22 and 53 are amended, and new claims 54 and 55 are submitted for introduction.

It is requested in view of the submitted amendments and following discussions that all rejections reported in the outstanding Office action be reconsidered and not repeated in any further action issued for this application.

Election/Restrictions

The Office action includes the following:

This application contains claims 1-6 drawn to an invention nonelected without traverse in Paper No. 02/20/2003. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action. (Office action, page 3.)

The most recent submitted Response for this application that addresses asserted restriction requirements was filed on May 21, 2004. That filed Response submitted a listing of all claims as is required for such a filing. The listing set out each of claims 1-6 as being "Withdrawn." These same claims 1 through 6, again, are submitted on the attached listing for this Amendment, and all of these claims are labeled as being "Withdrawn." Accordingly, it is understood that all requirements reported in the Office action concerning imposed restriction requirements made final now have been addressed including those directed to claims 1-6.

It further is noted that all claims that now have been resubmitted as "Withdrawn" are so withdrawn without prejudice to reintroduction of recited inventive subject matter in one or more subsequent applications claiming priority from the earliest filing date authorized by law. These so withdrawn claims are claims 1-21, 31-42, and 44-52.

Claim Rejections – 35 USC § 102

Claims 22-30, 43 and 53 are reported rejected under 35 USC §102(b) as being anticipated by Tabib-Azar, et al., "Non-Destructive Characterization of Materials by Evanescent Microwaves," Meas. Sci. Technology, Vol. 4, 1993, pp. 583-590 (hereinafter "Azar"). These anticipation rejections are submitted as being overcome in view of the following discussions and submitted claim amendments.

Of these reported anticipation rejections, only claims 22 and 53 are independent; all other reported anticipation rejections are directed to claims dependent from these two independent claims. In the outstanding Office action, it is reported with respect to asserted rejections of these two independent claims that Azar in Figures 1 and 4 discloses:

A method for measuring electrical impedance [see lines 1-4, section A, page 590] of a sample using a probe having a tip [see column 2 on page 589], comprising:

measuring interaction [section 2.1, page 584] between said tip and said sample without contacting [Fig 4] said sample with said tip; and

deriving electrical impedance [using computer from [sic] admittance, see equation 1, page 585 and 13 at page 586] from said tip-sample interaction. (Office action, pages 3-4)

These characterizations of Azar disclosures as having explicit or inherent context with respect to subject matter recited in claims 22 and 53 are discussed in detail below. Especially discussed below are the explicit and inherent disclosures found in Azar regarding probes and probe tips.

With respect to recited subject matter distinguishing over Azar, attention now is directed to both amended claims 22 and 53 with their recitations of a “microwave cavity probe having a pointed tip.” Support from the specification for recitation of a “microwave cavity probe” and a pointed tip” include among other disclosures those set out at page 4, lines 10-14, that are directed to Figure 1(A) showing an “evanescent probe structure comprising a... microwave cavity 10... [and a] sharpened metal tip 20 which, in accordance with the invention acts as a point-like evanescent field emitter as well as a detector....” Such original filed specification disclosures, among other such disclosures, renders introduction of the submitted claim amendments as not inserting any new matter.

It is asserted in the Office action that a “probe having a tip” is a structure described by Azar at “column 2 on page 589.” From reference to Azar column 2, on page 589, it is understood that the Office action assertion is premised from at least the statements that:

To examine the perpendicular decay constant of the fields at the tip of the probe, an aluminum covered glass plate was placed in front of the probe and the magnitude of the reflected microwave was monitored as a function of the distance between the tip of the probe and the surface of the aluminum

plate. Figure 10 shows a plot of the reflected microwave amplitude as a function of this distance.

Azar Figure 10 is reproduced here to assist in appreciating what is and what is not described.

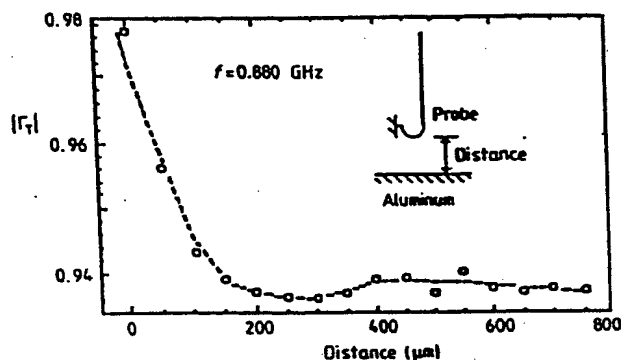


Figure 10. The output signal of the electric dipole probe as a function of the distance between the probe and an aluminium sample ($f = 0.880 \text{ GHz}$).

This figure labels a “probe” but not a tip. In context with the above reproduced Azar discussion directed to this figure, it is understood that one of ordinary skill in this art would interpret the referenced “tip” as being some portion of the labeled probe that is an “end, cap, or point.”¹ The Figure 10 labeled “probe” shows a semicircular line at one end positioned at an upper extension of a double arrowed line labeled “distance,” and the legend for this figure states that the “probe” is an “electric dipole probe.” Azar describes an “electric dipole probe” in Figure 1, which also is referenced in the above Office action reproduced assertions that are directed to claims 22 and 53. Again, Azar Figure 1 is reproduced here to assist in appreciating what is and what is not described.

¹ Webster’s Ninth New Collegiate Dictionary, Merriam-Webster Inc., 1987, defines “tip” at page 1237 as “1: the usu. pointed end of something 2: a small piece or part serving as an end, cap, or point-tipped.”

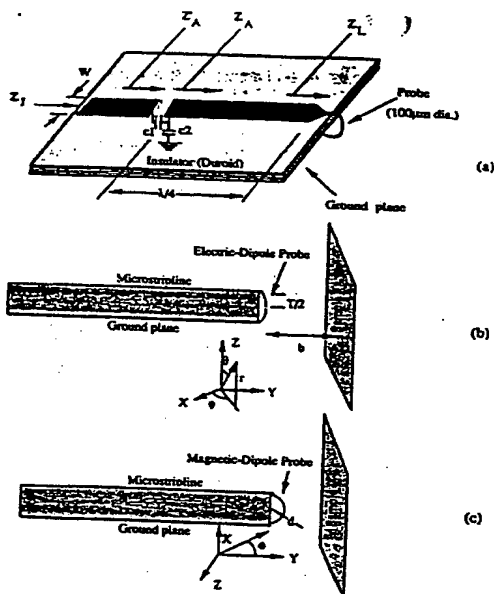


Figure 1. (a) Microstrip line resonator and the probe assembly. C_1 is a lumped capacitor and is used to adjust the coupling between the launcher and the resonator sections. C_2 is a tuning capacitor (lumped). (b) Electric dipole probe configuration. (c) Magnetic dipole probe configuration.

Azar Figure 1(b) is labeled as showing an electric-dipole probe, which in context with at least Azar Figure 10 is described as an illustration of a resonator including a microstripline having a connected wire, a ground plane having another connected wire, and with the two wires extending beyond ends of the microstripline and the ground plane. These two wires are shown and described in Figure 1(b) and through out the article as being shaped so as not to have their unconnected ends in contact with each other, but to have these ends facing each other across an open gap. Most specifically, Azar states that “[t]he open loop probe is a piece of wire that is connected to the ground through a capacitor (formed by the ends of wires) of the order of tenth of a picoFarad.” (Section 2.1, page 584.) It is the spacing between the unconnected ends of the wires that is understood as being structure characterizing the Azar “open loop.” It further is understood that this “open loop” structure is formed at an end of the Azar probe. These direct readings from Azar dictate that any Azar described probe tip understandable from Figures 1(b) and 10 and the article in context must be an electric-dipole probe structure formed from an extending pair of wires shaped to have an open gap between wire ends that are not in contact with each other. It is submitted on this subject that no more can reasonably be understood as being explicitly or inherently described by Azar concerning any electric-dipole probe tip.

Turning to subject matter recited in claims 22 and 53, the now recited “microwave probe having a pointed tip” is examined here in context with Azar as to whether any explicitly or inherently described structure(s) is read on by the recited “pointed tip.” Interpretation of this recited structure is dictated by the requirement that during patent application “examination, ‘claims...are to be given their broadest reasonable interpretation consistent with the specification, and...claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art.’ In re Bond, 910 F.2d 831, 833, 15 USPQ 2d 1566 (Fed. Cir. 1990)”²

As discussed above, a person of ordinary skill may without more limitation understand that a referenced “pointed tip” is some portion of the recited microwave probe that has a “point.” (See fn. 1 above.) Here this interpretation alone is insufficient to provide any proper conclusion as to the broadest reasonable interpretation because both method claims 22 and 53 further recite “measuring interaction between said tip and said sample without contacting said sample with said tip.” What then is encompassed by this recited “pointed tip” that provides for “measuring interaction...[with] said sample [but] without contacting said sample?” What portion of disclosed microwave probe structures is to be so utilized? To answer these questions in the broadest reasonable context a person of ordinary skill in this case must read the application specification as is an acknowledged procedure by the Federal Circuit and MPEP §2111.01. Reading the specification of this application leads to the factual interpretation that the recited “pointed tip” would be a pointed, i.e., a sharpened, portion of a metal single wire or rod extending from a microwave cavity so that such an end, i.e., tip, “acts as a point-like evanescent field emitter as well as a detector.” (Application specification, page 4, lines 10-14.) This original filed application specification disclosure is consistent with other such disclosures made on the subject through out the application specification. It is a microwave cavity probe having a pointed end of a metal wire or rod and such equivalents that is the totality encompassed by a reasonable broad interpretation for application prosecution of the claims 22 and 53 recitations of a “microwave cavity probe having a pointed tip” for “measuring interaction...[with] said sample [but] without contacting said sample.”

² In re American Academy of Science Tech Center, 367 F.3d 1359, 1364, 70 USPQ 2d 1827, 1830 (Fed. Cir. 2004)

Azar in explicit uncontroverted contrast does not describe any such pointed tip structure or related structure, but instead discloses a pair of wires bent to provide a gap between wire ends to provide a capacitor which in whole or in some unspecified part is understood as being the Azar asserted probe tip. Nowhere does Azar describe or suggest using a pointed tip for “measuring interaction” with any sample much less does Azar ever disclose or suggest what portion(s) if any other than the totality of the described probe with the pair of extending wires having a gap that could provide such function. It must be concluded because of the complete Azar article descriptions that it is all of the Azar semicircular bulbous shaped paired wires and gap structure that is the asserted Azar probe tip structure. This situation leads to an unavoidable ultimate conclusion that Azar in this aspect does not anticipate either independent claim 22 or claim 53 because the there recited “pointed tip” does not in any fashion read on any explicit or inherent Azar described aspect. In fact, the Azar described semicircular bulbous shaped paired wires with gap tip teaches away from the pointed tip recited in pending independent claim 22 and claim 53. Accordingly, the anticipation rejections of these two independent claims are overcome.

These conclusions concerning overcoming reported anticipation rejections, in at least part, are premised from the fact that:

[F]or [there to be] anticipation under 35 USC 102, the reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught must be inherently present. (Emphasis added, MPEP §706.02)

In this instance, as explained above, the cited Azar article does not directly or inherently teach “every aspect” of the invention recited in independent claims 22 and 53. Based on this requirement of patent law it is submitted above that Azar in no way anticipates independent claims 22 and 53.

The part of these conclusions directed to claims dependent from these two independent claims also reciting allowable subject matter is premised, at least in part, in the case of anticipation rejections from 35 USC §112, paragraph 4, where it is directed that a “claim in dependent form shall be construed to incorporate by reference all the limitations of the base claim to which it refers.” Thus, rejected dependent claims here include every limitation recited in their respective base independent claim 22 or claim 53 that is not disclosed or inherent in the Azar asserted article.

Accordingly, it is submitted that all anticipation reported rejected claims are not anticipated by the cited Azar article.³

New Claims

By this filing new independent claim 54 and dependent claim 55 are submitted to be introduced.

Independent claim 54 recites a method for measuring a sample “electromagnetic property” by “measuring probe parameters selected from the group consisting of resonant frequency shift and quality factor shift,” and claim 55, which is dependent from claim 54, recites that the “measurement is made using quasistatic approximation modeling.” Support for these claim recitations include among others the original filed specification disclosures at:

- Page 4, lines 7-8, “To determine the electrical properties of a sample, the variation in resonant frequency (f_r) and quality factor (Q) of a resonant cavity is measured. (FIG. 1(A))”; and,
- Page 2, lines 7-9, “The present invention also provides methods for qualitative estimation of microwave impedance using signals obtained by scanned evanescent microwave probe and quasistatic approximation modeling.”

Such original filed specification disclosures, among other such disclosures, renders introduction of the submitted new claims as not inserting any new matter.

It is submitted that the method covered in these new claims does not read on Azar because of at least the recitations for measuring both probe resonant frequency shift and probe quality factor shift to measure a sample electromagnetic property.

³ For the record it is noted that dependent claim 30 is reported as being anticipated by Azar, but no discussion of where Azar explicitly or inherently teaches every aspect of subject matter recited in this claim is found in the Office action. This claim is dependent from base independent claim 22, and as discussed above because this base independent claim is believed to not be anticipated so is its dependent claim 30 also believed not to be anticipated.

CONCLUSION

In light of the above discussions, it is believed that all amended, previously pending, and new claims now submitted are in condition for allowance and a notice of the same is requested. Should the Examiner have any question, request or suggestion, he is invited to contact the undersigned attorney at the telephone number indicated below.

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Respectfully submitted,

By 

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